Infant Health Statistics, Prosperity Region 4, Michigan

Prepared by Maternal and Child Health (MCH) Epidemiology Section, Michigan Department of Health and Human Services (MDHHS)
Data source: Michigan resident live birth files (12/12/2018) and infant mortality files (01/23/2019), Division for Vital Records and Health Statistics, MDHHS
June 2019

This presentation provides updated infant health statistics for prosperity region 4 in the State of Michigan.

This presentation was prepared by the Maternal and Child Health Epidemiology Section, Michigan Department of Health and Human Services (MDHHS).

Data source: Michigan resident live birth files (12/12/2018) and infant mortality files (01/23/2019), Division for Vital Records and Health Statistics, MDHHS

Revised: June 2019
The next several slides contain updated infant mortality rate statistics for prosperity region 4 in the State of Michigan.
Infant Mortality Rate, Prosperity Region 4, 2010-2017
(rate per 1,000 live births)

<table>
<thead>
<tr>
<th>Year</th>
<th># Live Births</th>
<th># Infant Death</th>
<th>IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>19,665</td>
<td>138</td>
<td>7.0</td>
</tr>
<tr>
<td>2011</td>
<td>19,681</td>
<td>127</td>
<td>6.5</td>
</tr>
<tr>
<td>2012</td>
<td>19,811</td>
<td>112</td>
<td>5.7</td>
</tr>
<tr>
<td>2013</td>
<td>19,591</td>
<td>117</td>
<td>6.0</td>
</tr>
<tr>
<td>2014</td>
<td>19,802</td>
<td>113</td>
<td>5.7</td>
</tr>
<tr>
<td>2015</td>
<td>19,625</td>
<td>124</td>
<td>6.3</td>
</tr>
<tr>
<td>2016</td>
<td>19,709</td>
<td>116</td>
<td>5.9</td>
</tr>
<tr>
<td>2017</td>
<td>19,387</td>
<td>95</td>
<td>4.9</td>
</tr>
</tbody>
</table>

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the infant mortality rates within prosperity region 4 from 2010 through 2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births. The infant mortality rate in prosperity region 4 has fluctuated quite a bit over the last eight years, but appears to be on a downward trend since 2015. In 2017, the infant mortality rate was 6.8 infant deaths per 1,000 live births for the State of Michigan and 4.9 infant deaths per 1,000 live births within prosperity region 4.

Data source: Michigan resident live birth files and infant mortality files, Division for Vital Records and Health Statistics, MDHHS
Infant Mortality Rates by Census Tract, Prosperity Region 4, 2013-2017 (rate per 1,000 live births)

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average infant mortality rates by census tract within prosperity region 4 for 2013-2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

Light green: no live births;
Grey: no infant deaths;
Yellow: below the mean of rates in Michigan (0.1 - 6.8 deaths per 1,000 live births);
Light blue: between the mean and mean + one standard deviation of rates in Michigan (6.9 – 15.0 deaths per 1,000 live births);
Dark blue: above the mean + one standard deviation of rates in Michigan (15.1 – 142.9 deaths per 1,000 live births).
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average infant mortality rates by maternal race/ethnicity within prosperity region 4 for 2013-2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births. For 2013-2017, there were some differences in infant mortality rates by maternal race and ethnicity within prosperity region 4, from a high of 12.4 deaths per 1,000 live births for Black non-Hispanic women to a low of 4.7 deaths per 1,000 live births for White non-Hispanic women. These statistics are comparable to the overall state rates by race and ethnicity with the exception of Asian/Pacific Islander mothers (6.0 deaths per 1,000 live births in prosperity region 4 compared to 4.2 deaths per 1,000 live births for the State of Michigan overall).
Infant Mortality Rates by Maternal Age, Prosperity Region 4, 2013-2017 (rate per 1,000 live births)

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average infant mortality rates by maternal age within prosperity region 4 for 2013-2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births. For 2013-2017, the infant mortality rate for prosperity region 4 was 10.5 deaths per 1,000 live births among women aged less than 20 years, 5.7 deaths per 1,000 live births among women aged between 20 and 29 years, and 5.1 deaths per 1,000 live births among women aged over 30 years. These statistics are slightly lower than the comparable overall state rates by maternal age.
Infant Mortality Rates by Maternal Education, Prosperity Region 4, 2013-2017 (rate per 1,000 live births)

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average infant mortality rates by maternal education within prosperity region 4 for 2013-2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births. For 2013-2017, the infant mortality rate for prosperity region 4 was 6.7 deaths per 1,000 live births among women who did not finish high school, 7.1 deaths per 1,000 live births among women who just finished high school, and 4.9 deaths per 1,000 live births among women who had more than a high school education. These statistics are lower than the comparable overall state rates by maternal age.

Average Infant Mortality Rate by Maternal Education, Prosperity Region 4, 2013-2017

<table>
<thead>
<tr>
<th>Maternal Education</th>
<th># Live Births</th>
<th># Infant Death</th>
<th>IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High School</td>
<td>11,713</td>
<td>78</td>
<td>6.7</td>
</tr>
<tr>
<td>High School</td>
<td>26,579</td>
<td>188</td>
<td>7.1</td>
</tr>
<tr>
<td>&gt; High School</td>
<td>59,484</td>
<td>289</td>
<td>4.9</td>
</tr>
</tbody>
</table>

2013-2017 Michigan Rates
- < HS = 10.4
- HS = 8.3
- > HS = 5.1

Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births.

Data source: Michigan resident live birth files and infant mortality files, Division for Vital Records and Health Statistics, MDHHS
Infant Mortality Rates by Payment Source,
Prosperity Region 4, 2013-2017 (rate per 1,000 live births)

Average Infant Mortality Rate by Payment Source,
Prosperity Region 4, 2013-2017

<table>
<thead>
<tr>
<th>Payment Source</th>
<th># Live Births</th>
<th># Infant Death</th>
<th>IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Insurance</td>
<td>56,544</td>
<td>257</td>
<td>4.5</td>
</tr>
<tr>
<td>Medicaid</td>
<td>38,216</td>
<td>282</td>
<td>7.4</td>
</tr>
</tbody>
</table>

2013-2017 Michigan Rates
Private Insurance = 5.0
Medicaid = 8.7

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average infant mortality rates by payment source within prosperity region 4 for 2013-2017. Infant mortality is defined as a death of a baby before his or her first birthday and is expressed as a rate per 1,000 live births. Payment source refers to source of expected payment that pregnant women use at delivery. For 2013-2017, the infant mortality rate for the state of Michigan was higher among women using Medicaid as the payment source (8.7 deaths per 1,000 live births) than those using private insurance (5.0 deaths per 1,000 live births). For 2013-2017, the infant mortality rate for prosperity region 4 was higher among women using Medicaid as the payment source (7.4 deaths per 1,000 live births) than women using private insurance (4.5 deaths per 1,000 live births). This comparison looks very similar when looking at the overall state rates by payment source.
Low Birthweight (LBW),
Prosperity Region 4, 2010-2017

The next several slides contain updated low birthweight statistics for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the incidence of low birthweight within prosperity region 4 from 2010 through 2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100. The incidence of low birthweight in prosperity region 4 has remained relatively stable over the last eight years. In 2017, the incidence of low birthweight was 8.8% for the State of Michigan and 7.6% for prosperity region 4.
Low Birthweight by Census Tract, Prosperity Region 4, 2013-2017

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of low birthweight by census tract within prosperity region 4 for 2013-2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100.

Light green: no live births;
Grey: no low birthweight births;
Yellow: below the mean of rates in Michigan (0.1% - 8.5%);
Light blue: between the mean and mean + one standard deviation of rates in Michigan (8.6% - 12.5%);
Dark blue: above the mean + one standard deviation of rates in Michigan (12.6% - 50.0%).
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of low birthweight by maternal race/ethnicity within prosperity region 4 for 2013-2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100. For 2013-2017, there were some differences in the incidence of low birthweight by maternal race and ethnicity within prosperity region 4, from a high of 14.5% for Black non-Hispanic women to a low of 6.8% for White non-Hispanic women. When looking at the State of Michigan as a whole, White non-Hispanic women report the lowest incidence of low birthweight at 7.0% and Black non-Hispanic women report the highest incidence at 14.3%.
Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of low birthweight by payment source within prosperity region 4 for 2013-2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100. Payment source refers to source of expected payment that pregnant women use at delivery. For 2013-2017, the incidence of low birthweight for prosperity region 4 was higher among women using Medicaid as the payment source (9.2%) than women using private insurance (6.6%). This comparison looks very similar when looking at the overall state rates by payment source.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of low birthweight by maternal age within prosperity region 4 for 2013-2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100. For 2013-2017, the incidence of low birthweight for prosperity region 4 was 10.1% among women aged less than 20 years, 7.5% among women aged between 20 and 29 years, and 7.4% among women aged over 30 years. These statistics are comparable to the overall state rates by maternal age.

<table>
<thead>
<tr>
<th>Maternal Age</th>
<th># Live Births</th>
<th># LBW</th>
<th>LBW %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 years</td>
<td>5,711</td>
<td>578</td>
<td>10.1</td>
</tr>
<tr>
<td>20-29 years</td>
<td>54,287</td>
<td>4,054</td>
<td>7.5</td>
</tr>
<tr>
<td>≥30 years</td>
<td>38,115</td>
<td>2,823</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.
Low Birthweight by Maternal Education, Prosperity Region 4, 2013-2017

Average Percent Low Birthweight (Birthweight <2,500 Grams) by Maternal Education, Prosperity Region 4, 2013-2017

<table>
<thead>
<tr>
<th>Maternal Education</th>
<th># Live Births</th>
<th># LBW</th>
<th>LBW %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High School</td>
<td>11,713</td>
<td>1,120</td>
<td>9.6</td>
</tr>
<tr>
<td>High School</td>
<td>26,579</td>
<td>2,322</td>
<td>8.7</td>
</tr>
<tr>
<td>&gt; High School</td>
<td>59,484</td>
<td>3,981</td>
<td>6.7</td>
</tr>
</tbody>
</table>

2013-2017 Michigan Percentages
- < HS = 11.0
- HS = 9.8
- > HS = 7.4

Low birthweight rate is defined as number of births with baby birthweight <2,500 grams per 100 live births.

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of low birthweight by maternal education within prosperity region 4 for 2013-2017. Low birthweight is defined as a birthweight of a baby less than 2,500 grams. The incidence of low birthweight is calculated as the number of low birthweight divided by the number of live births multiplied by 100. Payment source refers to source of expected payment that pregnant women use at delivery. For 2013-2017, the incidence of low birthweight for prosperity region 4 was 9.6% among women who did not finish high school, 8.7% among women who just finished high school, and 6.7% among women who had more than a high school education. These statistics are slightly lower than the comparable overall state rates by maternal education.
The next several slides contain updated very low birthweight statistics for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the incidence of very low birthweight within prosperity region 4 from 2010 through 2017. Very low birthweight is defined as a birthweight of a baby less than 1,500 grams. The incidence of very low birthweight is calculated as the number of very low birthweight divided by the number of live births multiplied by 100. The incidence of very low birthweight in prosperity region 4 has remained relatively stable over the last eight years. In 2017, the incidence of very low birthweight was 1.5% for the State of Michigan and 1.0% in prosperity region 4.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of very low birthweight by maternal race/ethnicity within prosperity region 4 for 2013-2017. Very low birthweight is defined as a birthweight of a baby less than 1,500 grams. The incidence of very low birthweight is calculated as the number of very low birthweight divided by the number of live births multiplied by 100. For 2013-2017, there were some differences in the incidence of very low birthweight by maternal race and ethnicity within prosperity region 4, from a high of 2.9% for Black non-Hispanic women to a low of 1.0% for White non-Hispanic women. When looking at the State of Michigan as a whole, American Indian women report the lowest incidence of very low birthweight at 1.0% and Black non-Hispanic women report the highest incidence at 3.2%.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of very low birthweight by maternal age within prosperity region 4 for 2013-2017. Very low birthweight is defined as a birthweight of a baby less than 1,500 grams. The incidence of very low birthweight is calculated as the number of very low birthweight divided by the number of live births multiplied by 100. For 2013-2017, the incidence of very low birthweight for prosperity region 4 was 1.6% among women aged less than 20 years, 1.2% among women aged between 20 and 29 years, and 1.2% among women aged over 30 years. These statistics are slightly lower than the comparable overall state rates by maternal age.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of very low birthweight by maternal education within prosperity region 4 for 2013-2017. Very low birthweight is defined as a birthweight of a baby less than 1,500 grams. The incidence of very low birthweight is calculated as the number of very low birthweight divided by the number of live births multiplied by 100. For 2013-2017, the incidence of very low birthweight for prosperity region 4 was 1.6% among women who did not finish high school, 1.5% among women who just finished high school, and 1.1% among women who had more than a high school education. These statistics are slightly lower than the comparable overall state rates by maternal education.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of very low birthweight by payment source within prosperity region 4 for 2013-2017. Very low birthweight is defined as a birthweight of a baby less than 1,500 grams. The incidence of very low birthweight is calculated as the number of very low birthweight divided by the number of live births multiplied by 100. Payment source refers to source of expected payment that pregnant women use at delivery. For 2013-2017, the incidence of very low birthweight for prosperity region 4 was higher among women using Medicaid as the payment source (1.5%) than women using private insurance (1.1%). This comparison looks very similar when looking at the overall state rates by payment source.
Preterm Birth (PTB),
Prosperity Region 4, 2010-2017

The next several slides contain updated preterm birth statistics for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the incidence of preterm birth within prosperity region 4 from 2010 through 2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100. The incidence of preterm birth in prosperity region 4 has remained relatively stable over the last eight years. In 2017, the incidence of preterm birth was 10.2% for the State of Michigan and 9.9% in prosperity region 4.
Preterm Birth by Census Tract, Prosperity Region 4, 2013-2017

Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.

Data source: Michigan resident live birth files, Division for Vital Records and Health Statistics, MDHHS

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of preterm birth by census tract within prosperity region 4 for 2013-2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100.

- Light green: no live births;
- Grey: no preterm births;
- Yellow: below the mean of rates in Michigan (0.1% - 9.9%);
- Light blue: between the mean and mean + one standard deviation of rates in Michigan (10.0% - 13.7%);
- Dark blue: above the mean + one standard deviation of rates in Michigan (13.8% - 42.9%).
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of preterm birth by maternal race/ethnicity within prosperity region 4 for 2013-2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100. For 2013-2017, there were some differences in the incidence of preterm birth by maternal race and ethnicity within prosperity region 4, from a high of 18.0% for American Indian women to a low of 9.1% for White non-Hispanic women. When looking at the State of Michigan as a whole, Asian/Pacific Islander women report the lowest incidence of preterm birth at 8.6% and Black non-Hispanic women report the highest incidence at 14.2%.

Preterm birth rate is defined as number of births delivered before 37 completed weeks of gestation per 100 live births. Gestational age is based on the obstetric estimate of gestation.

**Average Percent Preterm Birth (Estimated Gestational Age <37 Weeks) by Maternal Race/Ethnicity, Prosperity Region 4, 2013-2017**

<table>
<thead>
<tr>
<th>Maternal Race/Ethnicity</th>
<th># Live Births</th>
<th># PTB</th>
<th>PTB %</th>
</tr>
</thead>
<tbody>
<tr>
<td>White non-Hispanic</td>
<td>73,477</td>
<td>6,722</td>
<td>9.1</td>
</tr>
<tr>
<td>Black non-Hispanic</td>
<td>8,274</td>
<td>1,180</td>
<td>14.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11,357</td>
<td>1,042</td>
<td>9.2</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>2,163</td>
<td>233</td>
<td>10.8</td>
</tr>
<tr>
<td>American Indian</td>
<td>206</td>
<td>37</td>
<td>18.0</td>
</tr>
</tbody>
</table>

2013-2017 Michigan Percentages
- White, nH = 8.9
- Black, nH = 14.2
- Hispanic = 9.1
- Asian/Pacific Islander = 8.6
- American Indian = 10.9

Data source: Michigan resident live birth files, Division for Vital Records and Health Statistics, MDHHS
Preterm Birth by Maternal Age, Prosperity Region 4, 2013-2017

Average Percent Preterm Birth (Estimated Gestational Age <37 Weeks) by Maternal Age, Prosperity Region 4, 2013-2017

<table>
<thead>
<tr>
<th>Maternal Age</th>
<th># Live Births</th>
<th># PTB</th>
<th>PTB %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 years</td>
<td>5,711</td>
<td>579</td>
<td>10.1</td>
</tr>
<tr>
<td>20-29 years</td>
<td>54,287</td>
<td>5,039</td>
<td>9.3</td>
</tr>
<tr>
<td>≥30 years</td>
<td>38,115</td>
<td>3,891</td>
<td>10.2</td>
</tr>
</tbody>
</table>

2013-2017 Michigan Percentages
- < 20 years = 10.4
- 20-29 years = 9.4
- ≥30 years = 10.5

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of preterm birth by maternal age within prosperity region 4 for 2013-2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100. For 2013-2017, the incidence of preterm birth for prosperity region 4 was 10.1% among women aged less than 20 years, 9.3% among women aged between 20 and 29 years, and 10.2% among women aged over 30 years. These statistics were comparable to the overall state rates by maternal age.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of preterm birth by maternal education within prosperity region 4 for 2013-2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100. For 2013-2017, the incidence of preterm birth for prosperity region 4 was 10.7% among women who did not finish high school, 10.5% among women who just finished high school, and 9.1% among women who had more than a high school education. These statistics were slightly lower than the comparable overall state rates by maternal education.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of preterm birth by payment source within prosperity region 4 for 2013-2017. Preterm birth is defined as a birth of a baby less than 37 completed weeks of gestation. Gestational age is based on the obstetric estimate of gestation. The incidence of preterm birth is calculated as the number of preterm births divided by the number of live births multiplied by 100. Payment source refers to source of expected payment that pregnant women use at delivery. For 2013-2017, the incidence of preterm birth for prosperity region 4 was higher among women using Medicaid as the payment source (10.7%) than women using private insurance (9.1%). These statistics were comparable to the overall state rates by payment source.
Birth Defects Prevalence, by Race/ethnicity and Prosperity Region, 2016

The next two slides contain updated birth defects prevalence statistics for the State of Michigan as a whole and by Michigan prosperity region.
Throughout birth years 2006-2016, the birth defect prevalence rate for Michigan remained fairly steady at an average rate of 1,189.3 cases per 10,000 live births.

In 2016, the race-specific birth defect prevalence rate for cases born to black mothers (1,485.9 cases per 10,000 live births) exceeded that of cases born to white mothers (925.6 cases per 10,000 live births) and cases born to mothers of "other" races (1,372.5 cases per 10,000 live births).

In 2016, the ethnicity-specific birth defect prevalence rate for cases born to a mother reporting Arabic ethnicity (1,330.1 cases per 10,000 live births) was greater than that of cases born to a mother reporting Hispanic ethnicity (1,016.9 cases per 10,000 live births).

This slide uses data from the Michigan Birth Defects Registry and details the Michigan birth defects prevalence by maternal race and ethnicity for 2016.

The average overall birth defects prevalence for the State of Michigan during 2006-2016 was 1,189.3 cases per 10,000 live births.

In 2016, the birth defects prevalence among black mothers (at 1,485.9 cases per 10,000 live births) and mothers of other races (at 1,372.5 cases per 10,000 live births) was higher than that of white mothers (at 925.6 cases per 10,000 live births).

Furthermore, the birth defects prevalence among Hispanic (at 1,016.9 cases per 10,000 live births) and Arabic mothers (at 1,330.1 cases per 10,000 live births) was greater than that of white mothers (at 925.6 cases per 10,000 live births) in 2016.

Disclaimer: Data are based on passive reporting which means it is the responsibility of facilities to identify and report cases of birth defects. Not all facilities report cases as completely and timely as would be the ideal. Children diagnosed and treated in facilities in other states may be missed which will significantly affect the completeness of data for Michigan’s boarder counties.
Birth Defect Prevalence Rates by Prosperity Region: MBDR, 2016

- The State of Michigan is broken up into 10 prosperity regions based on shared geographic, demographic, and economic interests.
- In 2016, Michigan prosperity regions 6 and 10 reported the highest birth defect prevalence rates of 1,248.1 and 1,411.7 cases per 10,000 live births.
- The prosperity region that reported the lowest birth defect prevalence was region 1 with a prevalence rate of 405.6 cases per 10,000 live births.

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Cases</th>
<th>Prevalence Rate (per 10,000 live births)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>113</td>
<td>405.6</td>
</tr>
<tr>
<td>2</td>
<td>224</td>
<td>753.4</td>
</tr>
<tr>
<td>3</td>
<td>103</td>
<td>600.6</td>
</tr>
<tr>
<td>4</td>
<td>1,339</td>
<td>679.4</td>
</tr>
<tr>
<td>5</td>
<td>321</td>
<td>550.7</td>
</tr>
<tr>
<td>6</td>
<td>1,150</td>
<td>1,248.1</td>
</tr>
<tr>
<td>7</td>
<td>414</td>
<td>772.8</td>
</tr>
<tr>
<td>8</td>
<td>620</td>
<td>679.0</td>
</tr>
<tr>
<td>9</td>
<td>1,258</td>
<td>1,201.4</td>
</tr>
<tr>
<td>10</td>
<td>6,520</td>
<td>1,411.7</td>
</tr>
<tr>
<td>Total</td>
<td>12,062</td>
<td>1,063.9</td>
</tr>
</tbody>
</table>

*All statewide data reported from the Michigan Birth Defects Registry (MBDR) for birth year 2016
**Total reported birth defect cases for all diagnostic groupings per 10,000 live births.
***Prevalence rates are based on births to mothers living in Michigan at the time of delivery.
****Regions approximate prosperity region boundaries

This slide uses data from the Michigan Birth Defects Registry and details birth defects prevalence by prosperity region for 2016.

In 2016, regions 10, 6, and 9 reported the highest birth defects prevalence (at 1,411.7, 1,248.1, and 1,201.4 cases per 10,000 live births, respectively), while regions 1, 5, and 3 reported the lowest birth defects prevalence (at 405.6, 550.7, and 600.6 cases per 10,000 live births, respectively).

Disclaimer: Data are based on passive reporting which means it is the responsibility of facilities to identify and report cases of birth defects. Not all facilities report cases as completely and timely as would be the ideal. Children diagnosed and treated in facilities in other states may be missed which will significantly affect the completeness of data for Michigan’s boarder counties.
Treated Neonatal Abstinence Syndrome (NAS)
Prosperity Region 4, 2010-2016

The next couple slides contain updated treated neonatal abstinence syndrome statistics for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics and Michigan Inpatient Database, this slide shows the incidence of treated neonatal abstinence syndrome (NAS) within prosperity region 4 from 2010 through 2016. Infants with treated NAS were identified by any diagnosis of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code of 779.5 (drug withdrawal syndrome in newborn) through September 2015 or Tenth Revision (ICD-10-CM) diagnosis code of P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction) starting in October 2015. In 2016, the incidence of neonatal abstinence syndrome in prosperity region 4 was 578.4 per 100,000 live births.

Data source: Michigan Resident Inpatient Files created by the Division for Vital Records and Health Statistics, Bureau of Epidemiology and Population Health, Michigan Department of Health and Human Services, using data from the Michigan Inpatient Database obtained with permission from the Michigan Health and Hospital Association Service Corporation (MHASC).
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, this slide shows the average incidence of treated neonatal abstinence syndrome (NAS) by maternal race/ethnicity within prosperity region 4 for 2012-2016. Infants with treated NAS were identified by any diagnosis of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis code of 779.5 (drug withdrawal syndrome in newborn) through September 2015 or Tenth Revision (ICD-10-CM) diagnosis code of P96.1 (neonatal withdrawal symptoms from maternal use of drugs of addiction) starting in October 2015. In 2012-2016, there were some differences in the incidence of treated neonatal abstinence syndrome by maternal race and ethnicity, from a high of 624.4 per 100,000 live births for White non-Hispanic women to a low of 269.8 for Hispanic women.

Data source: Michigan Resident Inpatient Files created by the Division for Vital Records and Health Statistics, Bureau of Epidemiology and Population Health, Michigan Department of Health and Human Services, using data from the Michigan Inpatient Database obtained with permission from the Michigan Health and Hospital Association Service Corporation (MHASC).
Sleep-Related Infant Death Rate
Michigan, 2010-2017
Prosperity Region 4, 2010-2015

The next couple slides contain sleep-related infant death statistics for prosperity region 4 in the State of Michigan.
Overview of Sleep-Related Infant Deaths in Michigan

- Between 2010 and 2017 there were 1,136 sleep-related infant deaths in Michigan.
- The three-year moving average for sleep-related infant death decreased in 2015-2017, after having experienced an increasing trend for several years.
- Between 2010 and 2016 White infants experience lower sleep-related infant death rates as compared to Black infants and American Indian/Alaska Native infants.
- Between 2010 and 2016 Hispanic and non-Hispanic infants experienced similar sleep-related infant death rates.

Using data from the Michigan Public Health Institute (MPHI), Sudden Unexpected Infant Death (SUID) case registry this slide shows the three-year moving average and sleep-related infant death rate by race/ethnic demographic breakdown. A death is included in the MPHI SUID registry if it occurs in Michigan resident infants less than 1 year of age suddenly and unexpectedly. Sleep-related infant deaths include sudden infant death syndrome (SIDS), undetermined/sudden unexplained infant death (SUID), suffocation/positional asphyxia and other causes where the sleep-environment likely contributed to the death.

The three-year moving average increased from 12.2 per 10,000 live births in 2010 to 12.7 per 10,000 live births in 2014 to 2016, before decreasing to 12.5 per 10,000 live births in 2015 to 2017.

Data from 2010 to 2016 show Black infants experience the highest rate of Sudden Unexpected Infant Death (27.6 per 10,000 live births) followed by American Indian and Alaska Native Infants (18.8 per 10,000 live births). White infants experience the lowest rate of Sudden Unexpected Infant Deaths at 9.5 per 10,000 live births.
Between 2010 and 2015 there were 130 sleep-related infant deaths in Region Four.

Between 2010 and 2015 the sleep-related infant death rate in Region Four was 11.0 per 10,000 live births.

During this same time period, the Region Four sleep-related infant death rate was lower than the Michigan sleep-related death rate (12.8 per 10,000 live births).

Using data from the Michigan Public Health Institute, Sudden Unexpected Infant Death (SUID) case registry, this slide shows the sleep-related infant death rate in prosperity region four as compared to other prosperity regions in the state. Between 2010 and 2015, prosperity region four experienced a lower SUID rate as compared to Michigan overall, with a rate of 11.0 per 10,000 live births as compared to 12.8 per 10,000 live births for Michigan.
The next slide contains maternal morbidity data for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics, Michigan Resident Inpatient files, this slide shows severe maternal morbidity per 10,000 delivery hospitalizations, broken down by race and ethnicity. Severe maternal morbidity includes unexpected outcomes of labor and delivery that result in significant short or long-term health consequences. When looking at prosperity region four severe maternal morbidity by race, Black mothers experience the highest rate at 135.4 per 10,000 delivery hospitalizations, this compares to a rate of 75.5 per 100,000 delivery hospitalizations for prosperity region four overall.

Data source: Michigan Resident Inpatient Files created by the Division for Vital Records and Health Statistics, Bureau of Epidemiology and Population Health, Michigan Department of Health and Human Services, using data from the Michigan Inpatient Database obtained with permission from the Michigan Health and Hospital Association Service Corporation (MHASC).
The next couple slides contain maternal mortality data for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics and the Michigan Department of Health and Human Services, Michigan Maternal Mortality Surveillance Program, this slide shows the maternal mortality rate in prosperity region four as compared to the rest of the prosperity regions in Michigan. Maternal mortality is classified as a death that occurs during pregnancy or within one year of pregnancy. Prosperity region four experiences a lower maternal mortality rate than Michigan overall at 48.7 per 100,000 live births as compared to 59.7 per 100,000 live births for Michigan.

Using data from the Michigan Department of Health and Human Services, Division for Vital Records and Health Statistics and the Michigan Department of Health and Human Services, Michigan Maternal Mortality Surveillance Program, this slide shows maternal mortality rate by race and mortality type. Maternal mortality is classified as a death that occurs during pregnancy or within one year of pregnancy. Mortality type includes pregnancy-related (related to or aggravated by the pregnancy) and pregnancy associated (cause of death is unrelated to pregnancy).

Black mothers experience a maternal mortality rate of 133.7 per 100,000 live births as compared to a rate of 38.7 per 100,000 live births for White mothers in prosperity region four. Of the cases reviewed in region four, 14.5 percent were pregnancy related.
The next few slides contain maternal depression data for prosperity region 4 in the State of Michigan.
Using data from the Michigan Department of Health and Human Services Pregnancy Risk Assessment Monitoring System (MI PRAMS), the following slides show the prevalence of depression before and after pregnancy by maternal race/ethnicity. Numbers are reported as the proportion of mothers of live births reporting a certain condition. Birth years 2012-2015 are combined to provide more precision for subgroup estimates.

For the state as a whole: 8.9% of mothers report depression before pregnancy but no postpartum depression; 3.8% reported depression before pregnancy and postpartum depression; and 9.5% reported postpartum depression but no depression before pregnancy. The top two numbers in each bar added together are the proportion of women reporting postpartum depression. For the state as a whole, 9.5% + 3.8% = 13.3% of women report depression after pregnancy.

Notably - most women who report postpartum depression did not report depression before pregnancy. Most women who reported depression before pregnancy did not go on to report postpartum depression.

A small proportion of mothers reported depression both before and after pregnancy. There is variation by maternal race/ethnicity. Depression before pregnancy is relatively more common among NHW mothers than NHB mothers. Depression after pregnancy is relatively more common among mothers of NHB and Other race/ethnicity compared to NHW mothers.
Depression by time [before pregnancy only, after pregnancy only, both] is available for sub-state prosperity regions.

Postpartum depression (top two numbers per column) is relatively less common among mothers in prosperity region 9 and is more common among mothers in prosperity region 10. This difference in prosperity region 10 is being driven by significantly more postpartum depression in Wayne County (data not shown).

Due to small numbers in each region, few differences are statistically significant. The most important thing to take from this slide is that no region of the state is without maternal depression before and after pregnancy.
Looking at women reporting depression either before pregnancy and/or after pregnancy:

Between one quarter and one fifth of all Michigan mothers are affected by depression (22.2%).

By maternal race/ethnicity:
About one fifth of NHW mothers (20.8%) are affected by depression around the time of pregnancy.
About one quarter of NHB (25.6%) or other race/ethnicity (25.6%) mothers are affected by depression.

The most important thing to take from this slide is that a considerable proportion of mothers of all race/ethnicities are affected by depression either before pregnancy, after pregnancy, or at both times.
Looking at women reporting depression either before pregnancy and/or after pregnancy:

Between one quarter and one fifth of all Michigan mothers are affected by depression (22.2%).

Depression may be relatively more common among mothers of prosperity region 2, but the difference may be attributable to chance (p=0.0504). Depression was relatively less common among mothers of prosperity region 9 (p=0.0383) and prosperity region 10 (p=0.0051). The difference for prosperity region 10 is being driven by less overall depression among mothers of Oakland County (data not shown).

The most important thing to take from this slide is that a considerable proportion of mothers in all prosperity regions are affected by depression either before pregnancy, after pregnancy, or at both times.
Maternal Alcohol Consumption, Prosperity Region 4, 2012-2015

The next slide contains maternal alcohol consumption statistics for prosperity region 4 in the State of Michigan.
Alcohol use data calculated from the Michigan Department of Health and Human Services Pregnancy Risk Assessment Monitoring System (MI PRAMS). Numbers are reported as the proportion of mothers of live births reporting any alcohol consumption at a given time around pregnancy. Birth years 2012-2015 are combined to provide more precision for subgroup estimates.

Compared to mothers in the rest of the state, alcohol consumption before pregnancy and during pregnancy did not differ significantly for the mothers of prosperity region 4. However, it is notable that 6.5% of all MI mothers and 7.2% of prosperity region 4 mothers reported any alcohol consumption during the last 3 months of pregnancy.
Maternal Tobacco Use, 
Prosperity Region 4, 2012-2015

The next slide contains maternal tobacco use statistics for prosperity region 4 in the State of Michigan.
Smoking data calculated from the Michigan Department of Health and Human Services Pregnancy Risk Assessment Monitoring System (MI PRAMS). Numbers are reported as the proportion of mothers of live births reporting any cigarette smoking or whether smoking was allowed in their home during pregnancy. Birth years 2012-2015 are combined to provide more precision for subgroup estimates.

Smoking around pregnancy is a concern everywhere in the state, but there is no difference in the proportion of prosperity region 4 mothers compared to mothers in the remainder of the state. Smoking in the three months before pregnancy was significantly more prevalent among the mothers of prosperity regions 2, 5, and 6 (all p<0.05) and was significantly less prevalent among the mothers of region 10 (p<0.05). Smoking in the last three months of pregnancy was significantly more prevalent among the mothers of prosperity regions 2, 5, and 6 (all p<0.05) and was significantly less prevalent among the mothers of prosperity region 10 (p<0.05).
The next couple slides contain barriers to prenatal care statistics for the State of Michigan.
Barriers to PNC are from the 2016 and 2017 MI PRAMS survey. Responses are weighted to represent mothers of live births for those years.

About half (52.9%) of women who start prenatal care after the first trimester tell MI PRAMS that they were okay with the timing of when they started prenatal care. This may be one of the biggest obstacle to encouraging more women to start prenatal care early during pregnancy.

Among women who started PNC after the first trimester and wished that they had started sooner, we see that mom not knowing she was pregnant was the most common barrier to early PNC, followed by others on this graph.
Barriers to PNC are from the 2016 and 2017 MI PRAMS survey. Responses are weighted to represent mothers of live births for those years.

The graph on the left shows a few specific barriers to early PNC that were significantly more prevalent among NHB mothers than NHW mothers. Mother not knowing she was pregnant, having too many things going on, lack of transportation, and wanting to keep her pregnancy secret were more common for NHB mothers.

The graph on the right shows the total number of barriers cited by women who wished they had started PNC sooner. Most women (49.6%) have just one barrier that needed to be addressed to help them start PNC sooner. About a quarter have two barriers (23.1%) that would have helped them start PNC sooner.
The next slide contains pregnancy intention statistics for prosperity region 4 in the State of Michigan.
Pregnancy intention is calculated from the Michigan Department of Health and Human Services Pregnancy Risk Assessment Monitoring System (MI PRAMS). Numbers are reported as the proportion of mothers of live births reporting that they wanted to get pregnant at the time they conceived, or they had been wanting to get pregnant for some time before they conceived. Birth years 2012-2015 are combined to provide more precision for subgroup estimates.

At the regional level, there is no significant difference between prosperity region 4 and the rest of the state in the proportion of intended pregnancies. Within prosperity region 4 as in the rest of the state, intended pregnancy was more common for NHW mothers than NHB mothers. Intended pregnancy is less common among "other" race/ethnicity mothers of prosperity region 4 compared to "other" mothers in the rest of the state (p=0.0121).
Short Interpregnancy Interval, Prosperity Region 4, 2012-2015

The next slide contains short interpregnancy interval statistics for prosperity region 4 in the State of Michigan.
Short Interpregnancy Interval Pregnancy by Maternal Race/Ethnicity; Prosperity Region 4 | MI PRAMS 2012-2015

- Short Interpregnancy interval
- <18 months from prior live birth to LMP for this pregnancy
- Short IPI is more common among prosperity region 4 mothers
  - \( p = 0.0108 \)
- This may be driven by more short IPI among prosperity region 4 NHW mothers

Interpregnancy interval (IPI) is estimated from the Michigan Department of Health and Human Services Pregnancy Risk Assessment Monitoring System (MI PRAMS). Because PRAMS does not have the end date of mother's last pregnancy (whether it ended in a stillbirth, miscarriage, or termination), IPI here is calculated by counting the number of months between mother's last live birth and her date of last menstrual period before this pregnancy. Thus technically the PRAMS estimate of IPI is an inter-live-birth interval. Short IPI is defined as less than 18 months elapsed since mother's last live birth. The denominator is the proportion of Michigan mothers who have had a prior live birth. Birth years 2012-2015 are combined to provide more precision for subgroup estimates.

Compared to the rest of the state (29.8%) there are more women in prosperity region 4 (37.7%) who began this pregnancy less than 18 months after their last live birth \( (p=0.0108) \). For Michigan as a whole, short IPI is slightly more prevalent among NHW mothers (30.8%) than NHB mothers (28.3%) \( (p=0.0122) \). The same is true within prosperity region 4, but the size of the difference is greater (38.9% vs 23.5%) \( (p=0.0002) \). This is due to a relatively higher prevalence of short IPI among prosperity region 4 NHW moms compared to NHW moms in the rest of the state \( (p = 0.0280) \) in combination with a somewhat lower prevalence of short IPI among prosperity region 4 NHB moms compared to NHB moms in the rest of the state \( (p=0.0875; \text{non-significant}) \). Short IPI skews towards NHW moms in the state as a whole, and even more so in prosperity region 4. The difference seen in the final two columns is large, but due to small numbers this difference may be attributable to chance \( (p=0.1468) \).
Perinatal Periods of Risk (PPOR)
Prosperity Region 4, 2013-2017

The next several slides contain updated perinatal periods of risk (PPOR) statistics for prosperity region 4 in the State of Michigan.
This slide shows the feto-infant mortality rate within prosperity region 4 in Michigan from 2013-2017 for each of the four periods based on both birth weight and age at death: maternal health/prematurity, maternal care, newborn care, and infant health.

From 2013 to 2017 within prosperity region 4, the feto-infant mortality rate was 2.46 per 1,000 live births in the maternal health and prematurity period, 1.73 per 1,000 live births in the maternal care period, 1.33 per 1,000 live births in the newborn care period, and 1.52 per 1,000 live births in the infant health period.
This slide shows the feto-infant excess mortality rate within prosperity region 4 in Michigan from 2013-2017 for each of the four periods based on both birth weight and age at death: maternal health/prematurity, maternal care, newborn care, and infant health. The excess mortality rate is calculated by subtracting the mortality rate of the reference group from the mortality rate of the population group. The reference group is White non-Hispanic Michigan women, over 20 years and less than 40 years old, and at least 13 years education or intending to use private insurance at delivery.

From 2013 to 2017 within prosperity region 4, the excess feto-infant mortality rate was 0.63 per 1,000 live births in the maternal health and prematurity period, 0.25 per 1,000 live births in the maternal care period, 0.34 per 1,000 live births in the newborn care period, and 0.47 per 1,000 live births in the infant health period.
This slide shows the feto-infant mortality rate trend by PPOR period within prosperity region 4 in Michigan from 2013 to 2017.

From 2013 to 2017, in prosperity region 4, the feto-infant mortality rate in the maternal health and prematurity period increased from 2013 to 2014, and declined from 2014 to 2017. The rate in the newborn care period has been on a slow increase from 2013 to 2016, and then decreased in 2017. The rate in the infant health period has been on a slow increase from 2013 to 2015, declined in 2016, and then increased in 2017. The rate in the maternal care period decreased from 2013 to 2015, then went up in 2016, and then decreased in 2017.
This slide shows the feto-infant excess mortality rate trend by PPOR period within prosperity region 4 in Michigan from 2013 to 2017. The excess mortality rate is calculated by subtracting the mortality rate of the reference group from the mortality rate of the population group. The reference group is White non-Hispanic Michigan women, over 20 years and less than 40 years old, and at least 13 years education or intending to use private insurance at delivery.

From 2013 to 2017, in prosperity region 4, the feto-infant mortality excess rate in the maternal health and prematurity period increased from 2013 to 2014, and declined from 2014 to 2017. The rate in the newborn care period has been on a slow increase from 2013 to 2016, and then decreased in 2017. The rate in the infant health period has been on a slow increase from 2013 to 2015, declined in 2016, and then increased in 2017. The rate in the maternal care period decreased from 2013 to 2015, then went up in 2016, and then decreased in 2017.